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Bulletin 22

UNIE VAN SUID-AFRIKA

DEPARTEMENT MYNWESE

BOORGATTEMPERATURE

in die

GEBIEDE KLERKSDORP EN ORANJE-VRYSTAAT

deur

R. F. BOUWER, B.Sc.

Publikasie van die Afdeling Geologiese Opname

3a.

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UNION OF SOUTH AFRICA

DEPARTMENT OF MINES

BORE-HOLE TEMPERATURES

in the

KLERKSDORP AND ORANGE FREE STATE AREAS

by

R. F. BOUWER, B.Sc.

Publication of the Geological Survey Division

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Die Staatsdrukker/The Government Printer
Pretoria, 1954

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BOORGATTEMPERATURE IN DIE GEBIEDE KLERKSDORP EN ORANJE-VRYSTAAT

I.—INLEIDING

Daar is tans voldoende bewys gelever dat die Witwatersrandsisteem suidwaarts deur die Oranje-Vrystaat voortstrek tot by Virginia. Aangesien die Sisteem deur 'n groot dikte van jonger formasies oordek word, kon daar alleen deur 'n uitgebreide boorprogram vasgestel word hoe ver dit voortstrek; hierdie boorprogram nader tans voltooiing in die westelike Transvaal en die Oranje-Vrystaat.

Voor 1941 is temperature in sowat sestiën boorgate gemeet deur Krige.* In hierdie Bulletin word die voortsetting van sy werk gedek, en in hoofsaak word resultate uit boorgate wat na 1941 geboor is, opgeteken.

Gedurende 1948 is daar, uit hoofde van die feit dat goud en uraan in die konglomeraat van die Witwatersrandsisteem geassosieer is, besef dat radioaktiwiteitsopname moontlik vir die geoloog tot heelwat nut sou wees wat betref die korrelering van die sedimente waaruit die Sisteem bestaan. Inmiddels was daar ook 'n begeerte dat die werk van Krige in verband met die meet van temperature in boorgate deur die Afdeling Geologiese Opname uitgebrei moes word. Hy het kliniese termometers gebruik, maar hierdie stadige en moeisame proses vir die meet van boorgattemperatuur was natuurlik nie vir die omvattende program wat in die goudvelde beoog is, geskik nie, want hier sou dit weens finansiële oorwegings van groter belang wees om spoedig te vorder as om uiters akkuraat te wees. Dit was dus nodig dat 'n ander plan vir die meet van temperature, moontlik met behulp van elektroniese metodes, uitgedink moes word.

Hoewel die tegniek vir die meet van temperature in boorgate in die Verenigde State van Amerika tot 'n aansienlike peil ontwikkel is, moes nuwe instrumente ontwerp en vervaardig word vir Suid-Afrikaanse toestande. Heelwat moeilikheid is in verband met sowel die opname van radioaktiwiteit as van temperature ondervind deurdat die meettoerusting sodanig ontwerp moes word dat dit in tweeduimsboorgate neergelaat kon word. Die Wetenskaplike en Nywerheidsnavorsingsraad het daarin geslaag om instrumente te ontwikkel wat geslaagd geblyk het in plaaslike toestande. Tegniese besonderhede omtrent die „elektroniese termometer” verskyn in die volgende publikasies:—

Guelke, R., Heydenrych, J. C. R., and Anderson, F.—, Measurement of Radioactivity and Temperature in Narrow Boreholes, and the Development of Instruments for this Purpose”. *J. sci. Instr. Phys. Industr.*, 26, 5, 1949.

Heydenrych, J. C. R. and du Plessis, C. B. M.—, Instruments for Radioactivity and Temperature Measurements in Narrow Boreholes”. “*EASA*”, 9, 1952.

* Krige, L. J.—, Borehole Temperatures in the Transvaal and Orange Free State”. *Proc. roy. Soc. Lond.*, 173, 955, 1939.
Sien ook.—*Bull. geol. Opn. S. Afr.*, 18, 1948.

BORE-HOLE TEMPERATURES IN THE KLERKSDORP AND ORANGE FREE STATE AREAS

I.—INTRODUCTION

The extension of the Witwatersrand System through the Orange Free State as far south as Virginia has now been established adequately. As the System is overlain by a great thickness of younger formations, its continuation could be proved only by an extensive drilling-programme, which is now being completed in the western Transvaal and the Orange Free State.

Prior to 1941 Krige* measured temperatures in some sixteen bore-holes. The present Bulletin covers the continuation of this work ; in the main bore-holes drilled after 1941 are recorded.

In the course of 1948 the fact that gold and uranium are associated in the conglomerates of the Witwatersrand System led to the realisation that radioactivity logging might be of considerable assistance to the geologist in correlating the sediments that comprise the Witwatersrand System. At the same time it was desired that the Geological Survey should extend Krige's work on the measurement of temperatures in bore-holes. He had used clinical thermometers, but this slow and laborious process of obtaining bore-hole temperatures naturally was not suited to the comprehensive programme contemplated in the gold-fields ; here speed of operation would outweigh extreme accuracy because of financial considerations. It was thus necessary that some other means of measurement, possibly by electronic methods, should be evolved.

Although the technique of measuring temperatures in bore-holes has been developed extensively in the United States of America, new instruments had to be designed and constructed for South African conditions. Both radioactivity and temperature logging by electronic methods presented considerable difficulty in that the equipment had to be designed to go down a 2-inch bore-hole. The Council for Scientific and Industrial Research developed instruments that have proved successful under local conditions. Technical details of the "electronic thermometer" are contained in the following publications :—

Guelke, R., Heydenrych, J. C. R., and Anderson, F.—"Measurement of Radioactivity and Temperature in Narrow Boreholes, and the Development of Instruments for this Purpose". *J. sci. Instr. Phys. Industr.*, 26, 5, 1949.

Heydenrych, J. C. R. and du Plessis, C. B. M.—"Instruments for Radioactivity and Temperature Measurements in Narrow Boreholes". *EASA*, 9, 1952.

* Krige, L. J.—"Borehole Temperatures in the Transvaal and Orange Free State". *Proc. roy. Soc. Lond.*, 173, 955, 1939.

See also.—*Bull. geol. Surv. S. Afr.*, 18, 1948.

Die resultate, in hierdie Bulletin opgeteken, is alreeds as vertroulike inligting aan die Kamer van Mynwese beskikbaar gestel en word tans met die toestemming van die mynmaatskappye onder wie se beheer die gate geboor is, gepubliseer. Temperatuurmetings in dertig boorgate asook 'n opsomming word in tabelvorm aangegee. Die resultate is verkry deur die Geologiese Personeeleenheid van die Raad op Atoomkrag, en die werk is tesame met die radioaktiwiteitsopname uitgevoer.

Dit was nogal moeilik om resultate met dieselfde standaard van akkuraatheid te verkry. Talryke toetse in die veld het bewys dat ofskoon af en toe verskille van 0.5°C . verwag kan word, die instrument gewoonlik tot binne 0.2°C . akkuraat is indien kalibrering met twee kontrolepunte wat met kliniese termometers bepaal is, vergelyk word. Waar die temperature wat in die tabelle opgegee word met die „elektroniese termometer” gemeet is, word die kalibreringspunte met 'n sterretjie aangedui.

In sommige gevalle, bv. onder 'n dik bedekking van dolomiet, wat lae elektriese konduktiwiteit besit, of baie na-aan hoogspanningskabels, was die elektriese steuring sodanig dat dit op groter dieptes as 1,000 voet onmoontlik was om met die „elektroniese termometer” lesings te verkry. Boorgate HB 2, 8, 9, 10, en 15 ressorteer onder hierdie groep, en die metings is hier met kwiktermometers van die kliniese tipe gedoen.

Daar ontleding van die resultate buite die bestek van hierdie Bulletin is, kan ondergenoemde publikasie vir nadere inligting geraadpleeg word:—

R. F. Bouwer—„Measurement of Borehole Temperatures and the Effect of Geological Structure in the Klerksdorp and Orange Free State Areas”. *Trans. geol. Soc. S. Afr.*, LV, 1952.

The results recorded in this Bulletin have already been made available to the Chamber of Mines as confidential information ; they are now published with the consent of the mining companies under whose control the bore-holes were drilled. Temperature measurements in thirty bore-holes and a summary are presented in tabular form. The results were obtained by the Geological Unit of the Atomic Energy Board, the work having been carried out in conjunction with radioactivity logging.

Considerable difficulty was experienced in obtaining results with the same standard of accuracy. Numerous checks in the field have confirmed that although occasional discrepancies of 0.5°C . can be expected the accuracy of the instrument is generally of the order 0.2°C . when calibration is referred to two check-points obtained with clinical thermometers. Where the temperatures recorded in the tables were measured with the "electronic thermometer" the calibration-points are indicated by asterisks.

In some instances, e.g. under a thick cover of dolomite with its low electrical conductivity or in close proximity to high-tension cables, the electrical interference was such that no reading could be taken with the "electronic thermometer" when working to depths greater than 1,000 feet. Bore-holes HB 2, 8, 9, 10, and 15 fall in this category; here the measurements were obtained with mercury thermometers of the clinical type.

As analysis of the results falls outside the scope of this Bulletin, reference should be made to the following publication for further information :—

R. F. Bouwer—"Measurement of Borehole Temperatures and the Effect of Geological Structure in the Klerksdorp and Orange Free State Areas". *Trans. geol. Soc. S. Afr.*, LV., 1952.

II.—RESULTATE/RESULTS

TABEL/TABLE 1

Boorgat/Bore-hole.....	ST 7.
Plek/Locality.....	Stilfontein 39, Distrik Klerksdorp / Klerksdorp District.
Boordery voltooi/Drilling completed.....	24.7.48.
Temperatuur gemeet/Temperature measured	26.9.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—1,177	200	21·3	310
	400	20·8	
	600	21·3	
	800	21·9	
	1,000*	22·7	
Afdeling Onder-Witwatersrand/Lower Witwatersrand Division: 1,177—1,401	1,200	23·4	290
	1,400	24·1	
Jeppestownkwartsiet en -skalie met in- trusiewe gesteentes/Jeppestown quartz- zite and shale with intrusive rocks: 1,191—1,218; 1,250—1,289			
Goewermentrifkwartsiet en -skalie/ Government Reef quartzite and shale: 1,401—2,158	1,600	24·7	290
	1,800	25·5	
	2,000*	26·1	
	2,158	26·8	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 2

Boorgat/Bore-hole..... ST 9.

Plek/Locality..... Stilfontein 39, Distrik
Klerksdorp / Klerksdorp
District.

Boordery voltooi/Drilling completed..... 11.8.48.

Temperatuur gemeet/Temperature measured 17.10.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—666	200	21·1	310
	400	21·4	
	600	22·0	
Ventersdorplawa/Ventersdorp lava: 666—2,473	800	22·8	230
	1,000*	23·6	
	1,200	24·3	
	1,400	25·1	
	1,600	25·9	
	1,800	26·6	
	2,000	27·6	
	2,200	28·5	
	2,400	29·4	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 2,473—3,106	2,600	30·0	370
	2,800	30·7	
	3,000*	31·1	
	3,090	31·3	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 3

Boorgat/Bore-hole..... ST 11.
 Plek/Locality..... Stilfontein 39, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 16.10.48.
 Temperatuur gemeet/Temperature measured 13.9.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—768	200 400 600	21·0 21·0 21·3	520
Ventersdorplawa/Ventersdorp lava: 768—2,349	800* 1,000 1,200 1,400 1,600 1,800 2,000 2,200	21·8 22·9 23·5 24·1 24·9 25·6 26·5 27·3	260
Afdeling Onder-Witwatersrand/Lower Witwatersrand Division: 2,349— 3,268	2,400 2,600 2,800	27·9 28·5 29·1	300
Jeppestownkwartsiet en -skalie met in- trusiewe gesteentes/Jeppestown quartz- zite and shale with intrusive rocks: 2,557—2,601; 2,972—3,006	3,000 3,200	29·9 30·6	
Goewermentrifkwartsiet, -skalie, en -tilliet/Government Reef quartzite, shale, and tillite: 3,268—3,507	3,400 3,500*	31·1 31·5	300

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 4

Boorgat/Bore-hole..... ST 14.
 Plek/Locality..... Stilfontein 39, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 2.5.49.
 Temperatuur gemeet/Temperature measured 12.10.50.

Geologiese profiel (boorgatdoepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—966	200 400 600 800	21·2 21·2 21·5 22·1	360
Ventersdorplawa/Ventersdorp lava: 966—1,538	1,000 1,200 1,400	22·9 23·6 24·3	280
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 1,538—2,232	1,600 1,800 2,000* 2,200	24·8 25·4 25·8 26·3	400
Afdeling Onder-Witwatersrand/Lower Witwatersrand Division: 2,232— 4,973	2,400 2,600 2,800	27·1 27·9 28·7	290
Jeppetownkwartsiet en -skalie met in- trusiewe gesteentes/Jeppetown quart- zite and shale with intrusive rocks: 3,819—3,975; 4,621—4,688	3,000 3,200 3,400 3,600 3,800 4,000 4,200 4,400 4,600 4,800	29·4 29·9 30·4 30·9 31·7 32·6 33·2 33·9 34·4 35·2	
Goewermentrifkwartsiet, -skalie, en -til- liet/Goewernment Reef quartzite, shale, and tillite: 4,973—5,295	5,000 5,200 5,295*	35·9 36·6 37·1	290

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 5

Boorgat/Bore-hole..... UC 47.
 Plek/Locality..... Hartebeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 16.8.49.
 Temperatuur gemeet/Temperature measured 20.7.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—2,792	200	19.9	330
	400	19.9	
	600	20.2	
	800	20.8	
	1,000*	21.2	
	1,200	21.8	
	1,400	22.4	
	1,600	23.0	
	1,800	23.5	
	2,000	24.0	
	2,200	24.9	
	2,400	25.6	
	2,600	26.3	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 2,792—3,400	2,800	27.1	350
	3,000	27.8	
	3,200	28.3	
	3,400*	28.8	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 6

Boorgat/Bore-hole..... HB 2.
 Plek/Locality..... Hartbeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 22.9.49.
 Temperatuur gemeet/Temperature measured 23.7.51–25.7.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur (koors- termometers) Temperature (clinical thermometers) ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—1,807	200 400 600 800 1,000 1,200 1,400 1,600 1,800	20·6 21·1 21·9 22·9	410
Ventersdorplawa/Ventersdorp lava: 1,807—2,882	2,000 2,200 2,400 2,600 2,800	25·3 26·4 28·3 29·2	210
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 2,882—5,676 Intrusiewe gesteentes/Intrusive rocks: 3,125—3,130	3,000 3,200 3,400 3,600 3,800 4,000 4,200 4,400 4,600 4,800 5,000 5,200 5,400 5,600 5,676	29·7 30·1 30·8 31·3 31·7 32·3 32·8 33·5 34·0 34·6 35·4 35·9 36·4 37·1 37·3	360

TABEL/TABLE 7

Boorgat/Bore-hole..... HB 3.
 Plek/Locality..... Hartebeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 22.9.49.
 Temperatuur gemeet/Temperature measured 20.9.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—1,393	200 400 600 800 1,000 1,200	20·6 20·8 21·0 21·4 21·9 23·0	320
Ventersdorplawa/Ventersdorp lava: 1,393—2,866	1,400* 1,600 1,800 2,000 2,200 2,400 2,600 2,800	23·9 24·7 25·8 26·9 27·7 28·6 29·6 30·6	210
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 2,866—4,493	3,000 3,200 3,400 3,600*	31·3 31·9 32·4 33·0	340

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 8

Boorgat/Bore-hole..... HB 5.
 Plek/Locality..... Hartebeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 28.5.49.
 Temperatuur gemeet/Temperature measured 6.5.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—1,692	200 400 600 800 1,000 1,200 1,400* 1,600	20.4 20.6 21.0 21.4 22.1 22.7 23.2 23.8	410
Ventersdorplawa/Ventersdorp lava: 1,692—1,910	1,800	24.5	?
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 1,910—3,377	2,000 2,200 2,400 2,600 2,800 3,000* 3,200 3,300 3,377	25.4 26.2 26.9 27.7 28.3 29.0 29.8 30.1 30.4	270
Intrusiewe gesteentes/Intrusive rocks: 2,261—2,335			

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 9

Boorgat/Bore-hole..... HB 8.
 Plek/Locality..... Hartebeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 12.8.49.
 Temperatuur gemeet/Temperature measured 12.3.50-28.4.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur (koors- termometers) Temperature (clinical thermometers) ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—2,434	200	20.8	320
	400	21.1	
	600	21.2	
	800	21.6	
	1,000	22.1	
	1,200	22.5	
	1,400	23.1	
	1,600	23.7	
	1,800	24.3	
	2,000	25.0	
	2,200	25.7	
	2,400	26.6	
Ventersdorplawa/Ventersdorp lava: 2,434—3,632	2,600	27.5	220
	2,800	28.4	
	3,000	29.3	
	3,200	30.3	
	3,400	31.2	
	3,600	32.1	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 3,632—5,935 Intrusiewe gesteentes/Intrusive rocks: 3,907—3,919	3,800	32.8	380
	4,000	33.3	
	4,200	33.8	
	4,400	34.4	
	4,600	34.9	
	4,800	35.5	
	5,000	36.3	
	5,200	36.8	
	5,400	37.4	
	5,600	38.0	
	5,800	38.6	
	5,935	39.0	

TABEL/TABLE 10

Boorgat/Bore-hole..... HB 9.
 Plek/Locality..... Hartbeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 24.10.49.
 Temperatuur gemeet/Temperature measured 2.8.51-3.8.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur (koors- termometers) Temperature (clinical thermometers) ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—1,797	200 400 600 800 1,000 1,200 1,400 1,600	20·6 21·0 21·6 22·0 22·6 23·0 23·7 24·5	350
Ventersdorplawa/Ventersdorp lava: 1,797—1,845	1,800	25·1	?
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 1,845—3,700	2,000 2,200 2,400 2,600 2,800 3,000 3,200 3,400 3,600 3,700	25·7 26·4 27·0 27·5 28·4 29·0 29·5 30·4 30·9 31·2	310

TABEL/TABLE 11

Boorgat/Bore-hole.....	HB 10.
Plek/Locality.....	Hartebeesfontein 41, Distrik Klerksdorp / Klerksdorp District.
Boordery voltooi/Drilling completed.....	16.11.49.
Temperatuur gemeet/Temperature measured	1.8.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected).	Temperatuur (koors- termometers) Temperature (clinical thermometers) ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—2,020	200 400 600 800 1,000 1,200 1,400 1,600 1,800 2,000	20·7 21·1 21·4 21·9 22·5 22·8 23·2 24·0 24·7	430
Ventersdorplawa/Ventersdorp lava: 2,020—2,285	2,200	25·6	?
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 2,285—5,000 Intrusiewe gesteentes/Intrusive rocks: 2,723—2,751; 2,837—2,861	2,400 2,600 2,800 3,000 3,200 3,400 3,600 3,800 4,000 4,200 4,400 4,600 4,800 5,000	26·4 27·6 28·3 28·9 29·4 29·9 31·0 31·8 32·3 32·8 33·4 33·9	340

TABEL/TABLE 12

Boorgat/Bore-hole.....	HB 11.
Plek/Locality.....	Hartebeesfontein 41, Distrik Klerksdorp / Klerksdorp District.
Boordery voltooi/Drilling completed.....	18.3.50.
Temperatuur gemeet/Temperature measured	14.6.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—3,820	200 400 600 800 1,000 1,200 1,400 1,600 1,800 2,000* 2,200 2,400 2,600 2,800 3,000 3,200 3,400 3,600 3,800	21·0 21·3 21·3 21·6 22·0 22·3 22·6 23·5 24·3 24·8 25·6 26·3 27·0 27·7 28·3 28·9 29·2 29·6 30·2	380
Ventersdorplawa/Ventersdorp lava: 3,820—5,362	4,000 4,200 4,400 4,600 4,800 5,000 5,200	30·6 31·5 32·5 33·9 35·2 36·6 37·6	200
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 5,362—6,800 Intrusiewe gesteentes/Intrusive rocks: 6,016—6,026; 6,033—6,038; 6,363— 6,371; 6,441—6,456; 6,626—6,652; 6,693—6,695	5,400 5,600 5,800 6,000 6,200 6,400 6,600 6,800*	38·5 38·9 39·5 40·0 40·4 40·9 41·4 41·9	420

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 13

Boorgat/Bore-hole..... HB 14.
 Plek/Locality..... Hartebeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 3.6.50.
 Temperatuur gemeet/Temperature measured 13.6.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—2,177	200 400 600 800 1,000 1,200 1,400 1,600 1,800 2,000*	21·7 21·9 22·3 23·0 23·4 23·8 24·3 24·8 25·3 25·9	370
Ventersdorplawa/Ventersdorp lava: 2,177—3,687	2,200 2,400 2,600 2,800 3,000 3,200 3,400 3,600	26·9 27·7 28·3 29·1 29·8 30·9 31·9 32·6	240
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 3,687—5,200 Intrusiewe gesteentes/Intrusive rocks: 3,849—3,851; 3,862—3,869; 3,882— 3,888; 3,894—3,895; 4,053—4,057; 4,068—4,077	3,800 4,000 4,200 4,400 4,600 4,800 5,000 5,200*	33·2 33·8 34·3 34·9 35·3 35·9 36·4 37·0	360

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 14

Boorgat/Bore-hole..... HB 15.
 Plek/Locality..... Hartebeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 15.8.50.
 Temperatuur gemeet/Temperature measured 14.11.50–18.11.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur (koors- termometers) Temperature (clinical thermometers) ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1°C.)
Dolomiet/Dolomite: 0—1,674	100 400 700 900 1,100 1,400 1,600	21·3 21·6 21·9 22·6 23·2 24·2 24·9	350
Ventersdorplawa/Ventersdorp lava: 1,674—4,008	1,700 1,900 2,100 2,300 2,500 2,600 2,800 2,900 3,100 3,300 3,600 3,800 3,900	25·4 26·2 27·0 27·9 28·7 29·3 30·1 30·4 31·3 32·1 33·6 34·8	220
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 4,008—6,550 Intrusiewe gesteentes/Intrusive rocks: 4,050—4,101	4,100 4,300 4,600 4,700 4,900 5,100 5,300 5,500 5,700 5,900 6,100 6,300 6,500 6,550	35·5 36·0 36·8 37·1 37·6 38·1 38·8 39·3 39·6 40·2 41·0 41·5 42·1 42·2	390

TABEL/TABLE 15

Boorgat/Bore-hole..... HB 16.
 Plek/Locality..... Hartebeesfontein 41, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 6.11.50.
 Temperatuur gemeet/Temperature measured 20.7.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—1,912	200	20.9	350
	400	21.2	
	600	21.4	
	800	21.8	
	1,000*	22.1	
	1,200	22.5	
	1,400	23.2	
	1,600	23.7	
	1,800	24.6	
Ventersdorplawa/Ventersdorp lava: 1,912—2,917	2,000	25.3	220
	2,200	26.3	
	2,400	27.3	
	2,600	28.1	
	2,800	29.2	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 2,917—4,800	3,000	30.2	390
	3,200	30.8	
	3,400	31.4	
	3,600	31.9	
	3,800	32.6	
	4,000	33.4	
	4,200	33.8	
	4,400	34.3	
	4,600	35.1	
	4,800*	35.7	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 16

Boorgat/Bore-hole..... BU 1.

Plek/Locality..... Buffelsfontein 75, Distrik
Klerksdorp / Klerksdorp
District.

Boordery voltooi/Drilling completed..... 12.2.50.

Temperatuur gemeet/Temperature measured 18.10.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—3,646	200	20·0	320
	400	20·4	
	600	20·9	
	800	21·6	
	1,000	22·3	
	1,200	23·0	
	1,400	23·5	
	1,600	24·1	
	1,800	24·6	
	2,000*	25·2	
	2,200	25·8	
	2,400	26·4	
	2,600	27·2	
	2,800	27·8	
	3,000	28·3	
	3,200	28·9	
	3,400	29·7	
	3,600	30·6	
Ventersdorplawa/Ventersdorp lava: 3,646—5,156	3,800	31·6	220
	4,000	32·5	
	4,200	33·3	
	4,400	34·2	
	4,600	35·1	
	4,800	36·0	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 5,156—7,500 Intrusiewe gesteentes/Intrusive rocks: 5,380—5,385; 5,396—5,431; 5,760— 5,959; 6,007—6,054; 6,197—6,535; 6,716—6,779	5,000	37·1	360
	5,200	37·9	
	5,400	38·3	
	5,600	38·7	
	5,800	39·2	
	6,000		
	6,200	40·3	
	6,400	40·9	
	6,600	41·5	
	6,800	41·9	
	7,000	42·5	
	7,200		
	7,400	43·8	
	7,500*	44·3	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 17

Boorgat/Bore-hole..... BU 3.
 Plek/Locality..... Buffelsfontein 75, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 2.7.51.
 Temperatuur gemeet/Temperature measured 14.8.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature °C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—3,891	200	20·8	330
	400	20·9	
	600	21·6	
	800	22·1	
	1,000	22·5	
	1,200	23·1	
	1,400	23·6	
	1,600	24·2	
	1,800	24·8	
	2,000*	25·3	
	2,200	25·9	
	2,400	26·5	
	2,600	27·0	
	2,800	27·7	
	3,000	28·4	
	3,200	29·0	
	3,400	29·6	
	3,600	30·4	
	3,800	31·2	
Ventersdorplawa/Ventersdorp lava; 3,891—5,745	4,000	31·9	240
	4,200	32·7	
	4,400	33·4	
	4,600	34·3	
	4,800	35·2	
	5,000	36·2	
	5,200	37·4	
	5,400	38·0	
	5,600	38·7	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 5,745—6,600 Intrusiewe gesteentes/Intrusive rocks: 6,325—6,339; 6,586—6,600	5,800	39·4	320
	6,000	40·1	
	6,200	40·8	
	6,400	41·4	
	6,600*	41·8	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 18

Boorgat/Bore-hole..... WI 1.
 Plek/Locality..... Wildebeestpan 40, Distrik
 Klerksdorp / Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 19.6.51.
 Temperatuur gemeet/Temperature measured 12.7.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Serie Pretoria/Pretoria Series: 0—4,197	100*	20.7	280
Skalie/Shale: 0—1,301	200	21.0	
Intrusiewe gesteentes/Intrusive rocks:	400*	21.2	
1,301—1,616	600	22.1	
Skalie plus 10% intrusiewe gesteentes/ Shale plus 10% intrusive rocks:	800*	22.7	
1,616—2,789	1,000	23.4	
Intrusiewe gesteentes/Intrusive rocks:	1,200*	24.3	
2,789—3,288	1,400	24.9	
Skalie plus 8% intrusiewe gesteentes (kwartsities onderkant 3,885)/Shale plus 8% intrusive rocks (quartzitic below 3,885): 3,288—4,197	1,600*	25.6	
	1,800	26.1	
	2,000*	27.3	
	2,200	27.7	
	2,400*	28.7	
	2,600*	29.5	
	2,800	30.1	
	3,000*	30.9	
	3,200	31.6	
	3,400*	32.4	
	3,600*	33.0	
	3,800	34.0	
	4,000*	34.7	
Dolomiet/Dolomite: 4,197—4,500	4,200	35.6	330
	4,300*	35.7	
	4,400*	36.1	
	4,500*	36.3	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 19

Boorgat/Bore-hole..... DW 1.
 Plek/Locality..... Doornkom West 446, Distrik
 Viljoenskroon / Viljoens-
 kroon District.
 Boordery voltooi/Drilling completed..... 22.6.51.
 Temperatuur gemeet/Temperature measured 25.6.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Dolomiet/Dolomite: 0—1,900	200 400 600 800 1,000 1,200 1,400 1,600 1,800	19·8 20·6 21·2 21·8 22·3 23·0 23·6 24·2 25·0	310
Ventersdorplawa/Ventersdorp lava; 1,900—3,558	2,000 2,200 2,400* 2,600 2,800 3,000 3,200 3,400	25·8 26·5 27·3 28·4 29·3 30·3 31·2 32·2	220
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 3,558—6,400	3,600 3,800 4,000 4,200 4,400 4,600 4,800 5,000 5,200 5,400 5,600 5,800 6,000 6,200 6,400*	33·0 33·9 34·5 35·1 35·8 36·4 37·0 37·4 37·8 38·5 39·2 39·5 41·2	370

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 20

Boorgat/Bore-hole..... WS 1.
 Plek/Locality..... Wolwehuis 63, Distrik
 Klerksdorp/Klerksdorp
 District.
 Boordery voltooi/Drilling completed..... 8.5.51.
 Temperatuur gemeet/Temperature measured 15.8.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Ventersdorplawa/Ventersdorp lava: 0—4,569	200 400 600 800 1,000 1,200 1,400 1,600 1,800 2,000 2,200 2,400 2,600 2,800 3,000* 3,200 3,400 3,600 3,800 4,000 4,200 4,400	21.0 21.2 21.7 22.4 23.1 23.8 24.6 25.6 26.1 26.7 27.5 28.3 29.2 30.2 31.0 31.9 32.7 33.3 34.2 35.2 36.5 37.4	250
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 4,569—7,800	4,600 4,800 5,000 5,200 5,400 5,600 5,800 6,000 6,200 6,400 6,600 6,800 7,000 7,200 7,400 7,600 7,800*	38.2 38.5 39.1 39.4 40.0 40.6 41.0 41.5 42.0 42.5 42.9 43.7 44.2 44.7 45.3 45.8 46.3	390

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 21

Boorgat/Bore-hole.....	DT 1.
Plek/Locality.....	Diamant 1370, Distrik Oden- daalsrus/Odendaalsrus Dis- trict.
Boordery voltooi/Drilling completed.....	12.8.50.
Temperatuur gemeet/Temperature measured	19.8.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sandstone and shale: 0—508	200 400	20.7 22.0	160
Ventersdorplawa/Ventersdorp lava: 508—5,450	600 800 1,000 1,200 1,400 1,600 1,800 2,000 2,200 2,400 2,600 2,800 3,000 3,200 3,400 3,600 3,800 4,000* 4,200 4,400 4,600 4,800 5,000 5,200 5,400	23.0 23.6 24.2 25.3 26.4 28.0 28.8 29.7 30.3 31.1 32.1 33.1 34.0 34.7 35.6 36.4 37.4 37.9 38.8 39.6 40.5 41.2 42.2 43.1 44.1	230
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 5,450—8,100	5,600 5,800 6,000 6,200 6,400 6,600 6,800 7,000 7,200 7,400 7,600 7,800 8,000 8,100*	45.1 45.7 46.2 46.8 47.1 47.8 48.4 48.9 49.4 50.0 50.7 51.2 51.8 52.3	360

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 22

Boorgat/Bore-hole..... TV 2.
 Plek/Locality..... Spes Bona 210, Distrik Oden-
 daalsrus / Odendaalsrus
 District.
 Boordery voltooi/Drilling completed..... 17.9.49.
 Temperatuur gemeet/Temperature measured 3.2.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karooskale en -sandsteen/Karoo shale and sandstone: 0—571	200 400	21·3 22·5	140
Bo-Ventersdorpsedimente/Upper Ven- tersdorp sediments: 571—712	600	24·3	?
Ventersdorplawa/Ventersdorp lava: 712—4,500	800 1,000 1,200 1,400 1,600 1,800 2,000* 2,200 2,400 2,600 2,800 3,000 3,200 3,400 3,600 3,800 4,000 4,200 4,400	25·3 26·2 27·1 27·9 28·6 29·4 30·2 31·1 31·9 32·9 33·8 34·8 35·7 36·5 37·5 38·7 39·7 40·5 41·4	230
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 4,500—7,400	4,600 4,800 5,000 5,200 5,400 5,600 5,800 6,000 6,200 6,400 6,600 6,800 7,000 7,200 7,400*	42·1 42·7 43·1 43·5 44·0 44·4 44·9 45·6 46·2 46·9 47·5 48·4 48·9 49·5 50·0	390

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 23

Boorgat/Bore-hole..... VDH 4A.
 Plek/Locality..... Van den Heeversrus 410, Dis-
 trik Odendaalsrus / Oden-
 daalsrus District.
 Boordery voltooi/Drilling completed..... 14.5.51.
 Temperatuur gemeet/Temperature measured 18.5.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature °C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karooskale en -sandsteen/Karoo shale and sandstone: 0—628	200	19·9	120
	400	21·8	
	600	23·4	
Ventersdorp lava: 628—3,895	800	24·1	210
	1,000	25·2	
	1,200	26·2	
	1,400	27·0	
	1,600	28·1	
	1,800	29·1	
	2,000*	30·0	
	2,200	30·7	
	2,400	31·6	
	2,600	32·6	
	2,800	33·7	
	3,000	34·8	
	3,200	35·8	
	3,400	36·6	
	3,600	37·8	
	3,800	38·9	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 3,895—5,900 Intrusiewe gesteentes/Intrusive rocks: 4,860—4,863; 5,081—5,091; 5,166— 5,183	4,000	39·8	380
	4,200	41·0	
	4,400	41·7	
	4,600	42·3	
	4,800	42·8	
	5,000	43·2	
	5,200	43·7	
	5,400	44·2	
	5,600	44·9	
	5,800	45·3	
	5,900*	45·5	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 24

Boorgat/Bore-hole..... M 2.
 Plek/Locality..... Mooitoekomst 700, Distrik
 Odendaalsrus/Odendaals-
 rus District.
 Boordery voltooi/Drilling completed..... 11.9.50.
 Temperatuur gemeet/Temperature measured 14.9.50.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sandstone and shale: 0—1,160	200	23·0	110
	400	21·2	
	600	22·5	
	800	24·0	
	1,000*	26·4	
Ventersdorplawa/Ventersdorp lava: 1,160—2,159	1,200	27·9	230
	1,400	28·7	
	1,600	29·7	
	1,800	30·4	
	2,000	31·3	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 2,159—4,500 Intrusiewe gesteentes/Intrusive rocks: 4,488—4,498; 4,528—4,548	2,200	32·3	390
	2,400	33·1	
	2,600	33·8	
	2,800	34·3	
	3,000*	34·8	
	3,200	35·4	
	3,400	35·9	
	3,600	36·4	
	3,800	36·9	
	4,000	37·5	
	4,200	38·0	
	4,400	38·5	
	4,500*	38·8	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 25

Boorgat/Bore-hole..... LR 7.
 Plek/Locality..... La Riviera 289, Distrik
 Ventersburg/Ventersburg
 District.
 Boordery voltooi/Drilling completed..... 1.8.51.
 Temperatuur gemeet/Temperature measured 8.8.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sand- stone and shale: 0—1,003	200	15·9	140
	400	20·0	
	600	21·4	
	800	23·0	
	1,000	24·7	
Bo-Ventersdorplawa/Upper Venters- dorp lava: 1,003—1,463	1,200	25·9	210
	1,400	26·9	
Bo-Ventersdorpsedimente/Upper Ven- tersdorp sediments: 1,463—2,108	1,600	27·9	240
	1,800	28·7	
	2,000	29·4	
Onder-Ventersdorplawa/Lower Ven- tersdorp lava: 2,108—3,731 Intrusiewe gesteentes/Intrusive rocks: 2,328—2,361	2,200	30·3	260
	2,400	31·0	
	2,600	31·8	
	2,800*	32·5	
	3,000	33·3	
	3,200	34·0	
	3,400	34·8	
	3,600	36·0	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 3,731—5,400	3,800	36·7	410
	4,000	37·1	
	4,200	37·6	
	4,400	38·0	
	4,600	38·6	
	4,800	39·1	
	5,000	39·5	
	5,200	40·0	
	5,400*	40·4	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 26

Boorgat/Bore-hole..... PW 1.

Plek/Locality..... Portland 150, Distrik Ventersburg / Ventersburg District.

Boordery voltooi/Drilling completed..... 2.6.51.

Temperatuur gemeet/Temperature measured 6.6.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sandstone and shale: 0—942	200	20.2	150
	400	21.3	
	600	22.4	
	800	23.9	
Ventersdorplawa/Ventersdorp lava: 942—1,739	1,000	25.6	250
	1,200*	26.4	
	1,400	27.3	
	1,600	28.1	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 1,739—3,300	1,800	28.8	370
	2,000	29.4	
	2,200	29.9	
	2,400	30.4	
	2,600	30.7	
	2,800	30.9	
	3,000	31.9	
	3,200	32.7	
	3,300*	33.0	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 27

Boorgat/Bore-hole.....	BOS 1.
Plek/Locality.....	Brooklands 433, Distrik Ventersburg/Ventersburg District.
Boordery voltooi/Drilling completed.....	18.4.51.
Temperatuur gemeet/Temperature measured	24.4.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sand- stone and shale: 0—1,121	200	18·1	100
	400	19·4	
	600	21·6	
	800	23·5	
	1,000	25·6	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 1,121—3,400 Intrusiewe gesteentes/Intrusive rocks: 1,353—1,381; 1,633—1,826; 2,855— 2,982; 2,993—3,009; 3,082—3,085; 3,128—3,132; 3,179—3,310; 3,389— 3,400	1,200	27·4	290
	1,400	28·1	
	1,600	28·9	
	1,800*	29·6	
	2,000	30·1	
	2,200	30·9	
	2,400	31·6	
	2,600	32·3	
	2,800	32·8	
	3,000	33·7	
	3,200	34·2	
	3,400*	34·9	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 28

Boorgat/Bore-hole..... BH 1.

Plek/Locality..... Vergenoeg 89, Distrik Viljoenskroon / Viljoenskroon District.

Boordery voltooi/Drilling completed..... 28.6.51.

Temperatuur gemeet/Temperature measured 2.7.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sand- stone and shale: 0—571	200	20·5	140
Intrusiewe gesteentes/Intrusive rocks: 511—571	400	22·1	
Dolomiet/Dolomite: 571—3,021	600	23·0	300
	800	23·9	
	1,000	24·8	
	1,200	25·3	
	1,400	25·8	
	1,600	26·3	
	1,800	27·0	
	2,000	27·5	
	2,200	28·2	
	2,400	28·8	
	2,600	29·7	
	2,800	30·6	
Ventersdorplawa/Ventersdorp lava: 3,021—4,446	3,000*	31·4	200
	3,200	32·4	
	3,400	33·5	
	3,600	34·6	
	3,800	35·5	
	4,000	36·6	
	4,200	37·5	
	4,400	38·5	
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 4,446—8,000	4,600	39·1	380
Skalie en kleiige kwartsiet/Shale and argillaceous quartzite: 6,595—7,190	4,800	39·7	
Intrusiewe gesteentes/Intrusive rocks: 7,664—7,712	5,000	40·2	
	5,200	40·8	
	5,400	41·4	
	5,600	42·0	
	5,800	42·5	
	6,000	43·0	
	6,200	43·8	
	6,400	44·3	
	6,600	44·9	
	6,800	45·4	
	7,000	46·1	
	7,200	47·2	
	7,400	48·1	
	7,600	48·8	
	7,800	49·4	
	8,000*	50·1	

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 29

Boorgat/Bore-hole.....	RD 1.
Plek/Locality.....	Rosedale 898, Distrik Oden- daalsrus/Odendaalsrus Dis- trict.
Boordery voltooi/Drilling completed.....	27.7.51.
Temperatuur gemeet/Temperature measured	28.7.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature ° C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sandstone and shale: 0—625	200 400 600	16·3 18·1 20·3	120
Bo-Ventersdorplawa/Upper Venters- dorp lava: 625—1,047	800 1,000	21·3 23·2	140
Bo-Ventersdorpsedimente/Upper Ven- tersdorp sediments: 1,047—1,088	—	—	?
Onder-Ventersdorplawa/Lower Ven- tersdorp lava: 1,088—4,769	1,200 1,400 1,600 1,800 2,000 2,200 2,400 2,600 2,800* 3,000 3,200 3,400 3,600 3,800 4,000 4,200 4,400 4,600	24·6 25·6 26·6 27·7 28·6 29·5 29·9 31·4 32·3 33·2 34·3 35·3 36·4 37·1 37·9 38·8 39·6 40·6	220
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 4,769—5,800	4,800 5,000 5,200 5,400 5,600 5,800*	41·4 42·2 43·4 44·3 44·7 45·3	400

* Koorstermometers/Clinical thermometers.

TABEL/TABLE 30

Boorgat/Bore-hole..... WN 5.
 Plek/Locality..... Weltevreden 205, Distrik
 Odendaalsrus / Odendaals-
 rus District.
 Boordery voltooi/Drilling completed..... 27.7.51.
 Temperatuur gemeet/Temperature measured 27.7.51.

Geologiese profiel (boorgatdiepte in voet) Geological section (bore-hole depth in feet)	Diepte van waarneming in voet (geen korreksie) Depth of obser- vation in feet (uncorrected)	Temperatuur Temperature °C.	Gemiddelde geotermiese trap (vt./1° C.) Mean geother- mic step (ft./1° C.)
Karoosandsteen en -skalie/Karoo sandstone and shale: 0—495	200 400	19.3 22.0	80
Bo-Ventersdorsedimente/Upper Ven- tersdorp sediments: 495—752	600	23.7	?
Ventersdorplawa/Ventersdorp lava: 752—4,063	800 1,000 1,200 1,400 1,600 1,800 2,000 2,200 2,400 2,600 2,800 3,000* 3,200 3,400 3,600 3,800 4,000	24.6 25.4 26.1 27.0 28.0 29.0 30.0 30.9 31.9 32.9 33.7 34.8 36.0 37.0 37.7 38.8 39.8	220
Bo-Witwatersrandkwartsiet/Upper Wit- watersrand quartzite: 4,063—6,800	4,200 4,400 4,600 4,800 5,000 5,200 5,400 5,600 5,800 6,000 6,200 6,400 6,600 6,800*	40.6 41.1 41.4 42.0 42.6 43.0 43.5 44.1 44.5 45.1 45.8 46.3 47.0 47.6	360

* Koorstermometers/Clinical thermometers.

Boorgat Bore-hole	Plek Locality	Distrik District	GEMIDDELDE GEOTERMIESE TRAP / MEAN GEOTHERMIC STEP						
			Karoo- sisteem Karoo System	Pretoria- serie Pretoria Series	Dolomiet Dolomite	Ventersdorpsteem Ventersdorp System		Witwatersrandsteem Witwatersrand System	
						Bo-Ven- tersdorp- lava Upper Venters- dorp lava	Sedimente Sediments		Onder- Vents- dorp lava Lower Venters- dorp lava
ST 7	Stilfontein 39.....	Klerksdorp..			310				290
ST 9	Stilfontein 39.....	Klerksdorp..			310			230	370
ST 11	Stilfontein 39.....	Klerksdorp..			520*			260	300
ST 14	Stilfontein 39.....	Klerksdorp..			360			280	290
UC 47	Hartebeesfontein 41.....	Klerksdorp..			330				400
HB 2	Hartebeesfontein 41.....	Klerksdorp..			410				350
HB 3	Hartebeesfontein 41.....	Klerksdorp..			320			210	360
HB 5	Hartebeesfontein 41.....	Klerksdorp..			410			210	340
HB 8	Hartebeesfontein 41.....	Klerksdorp..			320			? 270*	280
HB 9	Hartebeesfontein 41.....	Klerksdorp..			350			? 310	380
HB 10	Hartebeesfontein 41.....	Klerksdorp..			430			? 340	310
HB 11	Hartebeesfontein 41.....	Klerksdorp..			380			200	420
HB 14	Hartebeesfontein 41.....	Klerksdorp..			370			240	360
HB 15	Hartebeesfontein 41.....	Klerksdorp..			350			220	390
HB 16	Hartebeesfontein 41.....	Klerksdorp..			320			220	390
BU 1	Buffelsfontein 75.....	Klerksdorp..			330			220	360
BU 3	Buffelsfontein 75.....	Klerksdorp..			330			240	320
WI 1	Wildebeespan 40.....	Klerksdorp..		280	330			220	370
DW 1	Doomkom West 446...	Viljoenskroon			310			220	390
WS 1	Wolwehuis 63.....	Klerksdorp..						250	360
DT 1	Diamant 1370.....	Oendaalsrus	160					230	390
TV 2	Spes Bona 210.....	Oendaalsrus	140					230	360
VDH 4A	Van den Heeverrus 410	Oendaalsrus	120					210	390
M 2	Mootoekomst 700.....	Oendaalsrus	110					230	380
LR 7	La Riviera 289.....	Ventersburg..	140				240	260	410
PW 1	Portland 150.....	Ventersburg..	150					250	370
BOS 1	Brooklands 433.....	Ventersburg..	100					200	290
BH 1	Vergenoeg 89.....	Viljoenskroon	140		300			220	380
RD 1	Rosedale 898.....	Oendaalsrus	120*				140	220	400
WN 5	Weltevreden 205.....	Oendaalsrus	80*				140	220	360
GEMIDDELDE / AVERAGE.....			130	280	350	210	240	230	370
									290

* Uitgesluit/ Excluded.

